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September 27, 2000

Ms. Magalie Roman Salas
Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: WT Docket 96-86

Dear Ms. Salas:

On behalf of the Association of Public-Safety Communications Officials-International, Inc. ("APCO") the undersigned submitted "Comments of APCO in Response to Fourth Notice of Proposed Rulemaking" in the above-referenced proceeding on September 25, 2000. Unfortunately, it appears that the copies submitted to the Commission are missing pages 7, 8, and 9. Therefore, I am enclosing herewith for filing with the Commission a complete corrected original and nine (9) copies of the Comments.

Please contact me should the Commission have any questions.

Respectfully submitted,

Robert M. Gurss
Counsel for APCO

cc: Thomas Sugrue
Kathleen O'Brian Ham
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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
The Development of Operational, Technical, and	)	
Spectrum Requirements for Meeting Federal, State	)	WT Docket No. 96-86
and Local Public Safety Agency Communications	)	
Requirements Through the Year 2010	)	

To: The Commission

COMMENTS OF APCO
IN RESPONSE TO
FOURTH NOTICE OF PROPOSED RULEMAKING

[corrected copy]

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September 25, 2000

COMMENTS OF APCO IN RESPONSE TO FOURTH NOTICE OF PROPOSED RULEMAKING

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SUMMARY

The most important and time-sensitive issue in the *Fourth Notice of Proposed Rulemaking* is the adoption of a narrowband digital standard for the Interoperability channels. APCO urges the Commission to act immediately (and, in any event, by the end of November) to finalize the adoption of Project 25 Phase I as that standard and, if necessary, to separate the standards question from other, less urgent issues.

APCO also proposes a specific migration plan to encourage the implementation of 6.25 kHz (or equivalent) technology on the General Use voice channels, where spectrum efficiency will be of greatest concern, especially once the 700 MHz band becomes fully available throughout the country. Interoperability channels, however, must continue to operate with the Project 25 Phase I (12.5 kHz) standard for the foreseeable future. This is the only approach that will preserve interoperability between future 6.25 kHz technologies, and with the 12.5 kHz equipment installed in the coming years.

APCO supports the recommendations of the Public Safety National Coordination Committee and urges that the Commission recognizes that enforceable national rules for applicants and Regional Planning Committees (RPCs) will be necessary in many cases to ensure real interoperability in the field. This includes rules related to permissive trunking subscriber equipment licensing, channel designation, and display labeling.

The Commission must also accept the NCC's recommendation that all RPCs be required to use a common "pre-coordination" database. Radio frequencies do not stop at artificial political boundaries. Thus, all RPCs, frequency coordinators, and applicants must make their decisions with knowledge of their neighbors' actions. The alternative would be chaos, and would endanger the safety of life, health, and property.

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To: The Commission

COMMENTS OF APCO
IN RESPONSE TO
FOURTH NOTICE OF PROPOSED RULEMAKING

The Association of Public-Safety Communications Officials-International, Inc. ("APCO") hereby submits the following comments in response to the Commission's *Fourth Notice of Proposed Rulemaking*, FCC 00-271, released August 2, 2000, ("*Fourth NPRM*"), in the above-captioned proceeding. The *Fourth NPRM* seeks comments regarding the Public Safety National Coordination Committee ("NCC") "Recommendations to Federal Communications Commission for Technical and Operational Standards for Use of the 764-776 MHz and 794-806 MHz Public Safety Pending development of Final Rules," dated February 25, 2000 ("NCC Report").

APCO is the nation's oldest and largest public safety communications organization, with over 15,000 individual members who manage and operate police, fire, emergency medical, highway maintenance, disaster relief, forestry-conservation, and other public safety communications systems. APCO is a certified frequency coordinator for Public Safety Pool channels, and has participated in all stages of this lengthy

proceeding regarding the new 700 MHz Public Safety Band. Many APCO members have also participated in and made significant contributions to the NCC.

I. The Commission Must Expedite Consideration of the Interoperability Standard.

The most critical and time-sensitive issue raised in the *Fourth NPRM* is the final adoption of a narrowband digital voice standard for the Interoperability Standards. Until that occurs, manufacturers cannot develop and market 700 MHz public safety radio equipment. Yet, there are significant portions of the nation, including many metropolitan areas, that could utilize the 700 MHz today without waiting for the end of the Digital Television (DTV) transition on Channels 60-69. Thus, at this point, the Commission's failure to adopt a standard is the major stumbling block preventing public safety utilization of the 700 MHz band, licensing for which had been mandated by Congress to begin TWO YEARS AGO, on September 30, 1998.[1]

While the *Fourth NPRM* seeks comments on many important issues, most are far less time-sensitive than the Interoperability standard question. Therefore, APCO urges that the Commission move quickly to finalize the Interoperability standard and, if necessary, defer action on the remaining issues in the *Fourth NPRM* to a separate proceeding. Manufacturers could then proceed with equipment development while the Commission and the NCC resolve various administrative matters. The comment period for the *Fourth NPRM* will close on October 10, 2000. Considering the extensive record previously submitted to the Commission on this issue and the critical need for action, APCO urges that the Commission act by the end of November.

[1] 47 C.F.R. § 337(b)(1).

Because of the importance of the standard issue, APCO will take it out of the order of presentation in the *Fourth NPRM* and discuss it first in these comments.

II. The Commission Should Adopt Project 25 Phase I as the Narrowband Voice Standard for Interoperability Channels, And a 6.25 kHz Migration Path for General Use Channels.

In concert with other important public safety organizations, APCO has strongly and consistently urged the Commission to adopt the Project 25 Phase I standard for the Interoperability channels. APCO advocated adoption of Project 25 Phase I in its comments in response to the *Second Notice of Proposed Rulemaking*, 12 FCC Rcd 17706 (1997), in a Petition for Reconsideration of the *First Report and Order*, 14 FCC Rcd 152 (1998), and in numerous *ex parte* communications.[2] The Commission, however, declined to adopt Project 25 Phase I in the *First Report and Order*, preferring to seek the recommendations of the NCC, a newly formed Federal Advisory Committee. The Commission expressed concern in the *First Report and Order* that Project 25 Phase I is 12.5 kHz bandwidth technology, and that it preferred a "more efficient" 6.25 kHz technology. On February 25, 2000, the NCC issued its Report which endorsed Project 25 Phase I by consensus, and urged the Commission to adopt the standard to facilitate implementation of the 700 MHz band. Five months later, on July 25, 2000, the Commission adopted the *Fourth NPRM*, with a tentative conclusion that it should approve Project 25 Phase I, but with migration path toward 6.25 kHz technology.

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[2] *See, e.g.*, Comments of APCO in Response to Second Notice of Proposed Rulemaking, filed December 24, 1997; Petition of APCO for Reconsideration and Clarification, filed December 2, 1998; Reply of APCO to Oppositions to Petitions for Reconsideration, filed February 23, 1999; *Ex Parte* Letter from APCO President Joe Hanna to Chairman Kennard, dated May 10, 2000.

APCO obviously supports the Commission's tentative decision to adopt Project 25 Phase I as the Interoperability standard for the 700 MHz Public Safety Band. Project 25 Phase I is a fully documented and approved ANSI/TIA standard that has undergone extensive review and consideration by the public safety community and manufacturers. The standard is now used by both Federal and state/local governments in other frequency bands, with Project 25 base and "subscriber" equipment being offered by numerous domestic and international manufacturers. Project 25 Phase I 700 MHz equipment could thus be available very quickly and put to use in the 700 MHz band in those areas where some or all of the public safety spectrum is unaffected by existing television stations.

While Project 25 Phase I is a 12.5 kHz standard (meaning that it provides one voice channel per 12.5 kHz), it provides the means for public safety users to implement competing and otherwise incompatible future 6.25 kHz technologies without sacrificing interoperability. There are several potential 6.25 kHz technologies under development, each of which utilizes fundamentally different modulation schemes. These include 6.25 kHz FDMA, 2-slot TDMA (providing 2 channels within a total of 12.5 kHz), and 4-slot TDMA (providing 4 channels within a total of 25 kHz). Radios using each of these technologies will NOT be interoperable with radios using the other technologies. Therefore, short of a premature selection of one 6.25 kHz technology, the only real option for the Commission at this time is to select a common mode available today (Project 25 Phase I), which can also be used as a "second" mode for future 6.25 kHz radios to provide full interoperability across competing and otherwise incompatible

technologies.[3] Someday, technology and marketplace forces may develop such that a common 6.25 kHz interoperability standard can be selected and phased-in. However, interoperability channels will need continue to operate with the Project 25 Phase I 12.5 kHz standard for the foreseeable future.

APCO agrees with the Commission, however, that it would be desirable to provide incentives for users and manufacturers to move forward in the development and implementation of 6.25 kHz technology, while maintaining Project 25 Phase I operation on Interoperability channels. In other words, the migration to 6.25 kHz, should be in the General Use channels, not the Interoperability channels.

Focusing on a General Use migration path is also consistent with the spectrum use and demands that are likely to arise in the future. The General Use channels constitute the largest portion of the 700 MHz Public Safety Band, but will also be the subject of the most intensive demand by public safety agencies for their growing day-to-day internal communications requirements. As time progresses, the need for greater spectrum efficiency will arise in the General Use channels long before the generous allocation of 2.5 MHz of Interoperability spectrum is exhausted.

APCO proposes a migration plan below which should meet the twin goals of promoting efficiency and maintaining interoperability. Initially, all radio equipment installed in the band will be "pure" 12.5 kHz radios, without any capability to operate in a 6.25 kHz channel (or provide one voice-channel per 6.25 kHz of spectrum). However, APCO's proposed plan creates certain incentives for the eventual introduction of

[3] The Project 25 Statement of Requirements for Phase II (6.25 kHz technology) requires all proposed technologies, regardless of technique, to include the Project 25 Phase I 12.5 kHz standard for interoperability purposes and for graceful migration between Phase I and Phase II.

6.25 kHz capable radios, without requiring a specific 6.25 kHz technology. To maintain interoperability, those 6.25 kHz radios will also need to have the Project 25 Phase I mode for 12.5 kHz operation on the Interoperability channels. These would thus be dual-mode radios, containing the Project 25 Phase I mode for operation on the Interoperability channels, and one of the several 6.25 kHz technologies for potential use on the General use channels.

Eventually, the Commission may be able to designate a 6.25 kHz Interoperability standard, either because of unforeseeable technological developments, or because the marketplace has coalesced around a single 6.25 kHz technology. At that point, the Commission could adopt a second migration plan for the Interoperability channels, though it will probably need to be a very long transition to prevent loss of interoperability with legacy systems.

A successful migration path should include two basic phases. First, there must be a requirement for new equipment to have the newly desired capability (*e.g.*, 6.25), which can be accomplished either through a type-acceptance requirement imposed on manufacturers, or a requirement that as of a certain date all equipment installed for new radio systems include the new capability. The disadvantage of relying on type-acceptance is that manufacturers can continue to build and sell previously type-accepted equipment indefinitely. However, imposing a requirement on new systems creates problems with distinguishing between new systems and additions to existing systems.

In any event, the second migration phase should be a requirement that all legacy equipment be replaced by a date certain, though the date must be far enough out to ensure

that licensees will be afforded a full "normal" life span for their equipment. Up to now, the Commission has been reluctant to impose such mandatory equipment replacement requirements. However, APCO has long held that mandatory migration is necessary to ensure that all users have an opportunity to benefit from more efficient technology. The absence of such a requirement in bands below 470 MHz is one of the principal reasons that users are unlikely to see much benefit from "spectrum refarming" for many years to come.

In light of the above, APCO proposes the following specific migration plan for the 700 MHz Public Safety Band. All references to 6.25 kHz are to 6.25 kHz or equivalent technology (*e.g.*, 2-slot or 4-slot TDMA).

Step 1: Immediate adoption of Project 25 Phase I as the Interoperability Standard. This will allow users and manufacturers to move forward now with existing technology to implement 700 MHz systems wherever the 700 MHz band is not blocked by television stations.

Step 2: As of December 31, 2006 **OR** within 6 months following FCC notice that at least 15 of the top 20 metropolitan areas (including at least 7 of the top 10 metropolitan areas) have been cleared of all relevant television stations (full power co-channel and adjacent channel stations), **WHICHEVER IS LATER**, all newly type-accepted radios for voice use in the band must have:

(i) the capability to provide one voice channel per 6.25 kHz, **AND**

(ii) must still meet the Project 25 Phase I (12.5 kHz) standard for the interoperability channels.

As discussed above, preserving 12.5 kHz as the interoperability standard is essential to maintain interoperability across technologies (TDMA/FDMA/TETRA). At the same time 6.25 kHz could provide greater efficiency, which may be particularly important for the General Use channels in the top 20 markets, once the spectrum is cleared in those areas. While the DTV transition is scheduled to end in 2006, statutory "loopholes" are likely to allow many televisions stations to remain on channels 60-69 well past that date. Forcing manufacturers to produce 6.25 kHz capable radios (and forcing public safety users to purchase those radios) prior to the DTV transition would be an unnecessary burden.

An essential element of this Step 2 is that it does not discourage the immediate development and near term implementation of 700 MHz Project 25 Phase I 12.5 kHz systems. While radios will eventually need to have 6.25 kHz capability, those radios will also require Project 25 Phase I capability, which is consistent with the Project 25 Statement of Requirements.[4] Thus, manufacturers will have an incentive today to invest in the development of Project 25 Phase I capable radios for the 700 MHz band, recognizing that such capability will be required even for future 6.25 kHz capable radios Similarly, users must be able to install 12.5 kHz Project 25 Phase I equipment within the next few years safe in the knowledge that they will be able to continue operating that equipment throughout its normal life cycle.

Step 3: For the top 50 metropolitan areas, all General Use operations must be at 6.25 kHz by 10 years after the date established above in Step 2 (imposing the 6.25 kHz type-acceptance requirement). Interoperability channels would still be at 12.5 kHz operations

[4] *See* n. 3, *supra*.

to retain interoperability across technologies. This is intended to provide a minimum 10-year life cycle for "pure" 12.5 kHz radios (*i.e.*, without 6.25 kHz capability) purchased between "now" and the date established in Step 2, while mandating more efficient operations in major metropolitan areas on the General Use channels as of a date certain. Ten years is currently the generally accepted life span for many elements of a radio system, though there is evidence that this period may be shrinking as equipment is increasingly being replaced prior to be "worn out" because of a need or desire to add new capabilities or capacity. On the other hand, a certain number of users are likely to continue using old equipment as long as possible. It must also be noted that infrastructure (base stations) will last much longer (typically more than ten years) than portable and mobile radios.

Step 4: For areas outside the top 50 metropolitan areas, all General Use operations must be at 6.25 kHz by 15 years after the date established above in Step 2 (imposing the 6.25 kHz type acceptance requirement). However, rural users should be allowed maintain 12.5 kHz operation indefinitely on a secondary basis.

Step 5: As of the date established in Step 2, the Commission should re-examine technological and marketplace developments as of that date and determine whether it is possible to develop a migration path for the subsequent transition a 6.25 kHz Interoperability standard. The key issue should be whether interoperability between various technologies (*e.g.*, TDMA and FDMA) will still require Project 25 Phase I interoperability at 12.5 kHz. Any such migration path will need to be graduated to ensure

seamless interoperability as new equipment is placed in operation, and that users get a full life cycle from their Project 25 Phase I equipment.

APCO recognizes that the most controversial aspect of this proposal may be the mandatory conversion dates for 6.25 kHz in the General Use channels at a future date. However, APCO's overall proposal stands on its own without that mandatory requirement. The Commission could simply skip steps 3 and 4. Thus, in the interest of expedited consideration of the core interoperability standard issue, APCO would support a quick decision by the Commission to adopt only steps 1, 2, and 5, with a commitment to revisit the issue of mandatory transition at a future date (perhaps coincident with Step 2).

Finally, the Commission should not impose any 6.25 kHz migration on the data channels. The Project 25 Phase I data standard already meets the Commission's 4.6 kbps per 6.25 kHz requirement. The trend in mobile data applications is towards wider, not narrower, channels. Thus, improved efficiency in data channels is likely to result from higher bit rates to improve data throughput in existing (or wider) channel widths.

III. THE COMMISSION SHOULD FOLLOW THE NCC RECOMMENDATIONS ON ALL OTHER ISSUES RAISED IN THE *FOURTH NPRM*.

The following comments will address only those issues raised in the *Fourth NPRM* that go beyond merely asking for comment as to whether the Commission should adopt the NCC's recommendations. APCO supports those recommendations, as well as the NCC's Comments filed in response to the *Fourth NPRM*.

NCC has asked the Commission to include various interoperability requirements into its rules. A common theme in the *Fourth NPRM*, however, is that the Commission, while not disagreeing with the substance of the NCC recommendations, is reluctant to codify those recommendations as Commission rules. APCO understands and, in many circumstances, agrees with the general regulatory philosophy of minimizing Commission involvement in favor of local discretion and/or marketplace forces. However, public safety interoperability requires a certain level of uniform, mandatory rules or procedures. Without national oversight, individual agencies, planning committees, and equipment vendors will "go their own way" and develop procedures and equipment which are incompatible across regional boundaries. This impacts both regional boundary areas and sites of major "national" emergencies such as wildfires and storms where public safety personnel from across the nation may be working together and require interoperability. That interoperability requires BOTH compatible radio equipment and compatible procedures for using those radios. Thus, the Commission's goal of promoting interoperability may require that it adopt more detailed regulation that it might otherwise prefer. In some instances however, those regulations could take the form of requiring applicants and RPCs to comply with Commission approved procedures adopted by the NCC.

Permissive Trunking: APCO supports the NCC recommendations, and the Commission's proposal to limit trunking in the Interoperability portion of the band to just ten of the channels sets, and then only on a strict secondary, permissive basis. However,

it is important for the Commission to understand the role of trunking in the 700 MHz band, and its relationship to Interoperability.

One of the major uses of the 700 band will be the support of large, multi-jurisdictional systems comprised of dissimilar agencies. Trunking, regardless of the base technology, will be the primary mode of operation (as compared to conventional mode of one channel, one talk group) in the 700 MHz band. Interoperability becomes a component of such systems through the planning and implementation of specific talk groups pre-planned and available to all mobile subscribers of the system. Such systems, if large and inclusive enough, and with sufficient operational planning and guidelines, may often suffice as the only needed interoperability requirement for users of that system. This does not negate the requirement to anticipate or plan for operations with itinerate mobile units that are not part of that system.

However, systems that do provide a trunked mode system for a large number of dissimilar agencies and jurisdictions should be mandated by the RPC in their area to provide a minimum scope of interoperability through dedicated talk groups. Such an internal trunked system interoperability plan should parallel the interoperability requirements specific to the Interoperability channels and any such regional plan that is specified for the Interoperability channels for operation outside of the trunked mode of operation (but still within the coverage of the trunked system). Such regional plans should also include operational plans to address the interaction between mobile units that are a part of that trunked system and itinerant mobiles. Plans should also provide for monitoring of conventional mode interoperability call channels (at appropriate command centers) for use with both that system's mobiles as well as foreign itinerant mobiles.

In response to the Commission's specific questions in ¶13, APCO urges that specific trunking rules such as those recommended by NCC are critical to maintain nationwide interoperability. As noted above, some basic level of uniformity is essential if interoperability is to be maintained regardless of regional boundaries. One proposed requirement that needs additional clarification concerns mandatory discontinuation of trunking of Interoperability channels. That should occur only if the responding agencies are not participants in the trunked radio system (which would otherwise provide the means for interoperability through talk groups, as discussed above), and if there are no conventional Interoperability channels available.

Guard Bands: APCO supports the NCC recommendations described in this section of the Fourth NPRM, ¶¶14-18. Further, APCO supports the revised band plan adopted by the NCC and proposed to the Commission in its Comments. Adoption of that plan will facilitate flexibility to create contiguous spectrum blocks, without posing new adjacent channel interference problems. In addition, the recommended change allows for more efficient use in systems by placing the Interoperability channels and their associated guard channels at 250 kHz spacing to allow for better implementation in antenna system combiners.

SEICs: APCO agrees with the NCC's recommendations regarding the creation of State Interoperability Executive Committees (SEICs) to handle the administration of interoperability channels. APCO also supports the Commission's proposal that if a SEIC or other state agency does not agree to oversee the development of an interoperability plan, the RPC's should fulfill that role.

Subscriber Equipment Licensing: It is essential that users of subscriber equipment (mobiles and portables) abide by all Interoperability requirements in their region. APCO thus agrees with the NCC recommendation that the Commission require licensing of subscriber equipment where the user is not otherwise a 700 MHz band licensee. As an alternative, the Commission could require that all users, including those that only operate subscriber equipment in the band, enter into a Memorandum of Understanding with the relevant SEIC or RPC, as proposed by the NCC.

Channel Designation and Display Labeling: This is an example of an area where the Commission must adopt operational rules to give meaning to its more technical Interoperability requirements. All too often technical capabilities go unused because personnel are not familiar with those capabilities or the nomenclature for implementing those capabilities. A direct example occurred during the Laguna Hills fires in California, where some firefighters from non-local departments failed to comply when told to transmit on a particular mutual aid channel, not because they lacked that channel on their radio, but because of unfamiliar terminology for that channel.

To some extent this type of problem can be addressed on a regional level, as suggested by the Commission. However, major emergencies increasingly require the

assistance of responders from distant areas. Thus, there needs to be some method to ensure that, for example, when firefighters from Fairfax County, VA are assisting firefighters in Montana, they are able to fully utilize the interoperability tools mandated by the Commission.

Receiver Standards: APCO has long supported the need for receiver standards on public safety channels, and supports the efforts of the NCC to recommend parameters to be included in any such standards.

As the Commission is well aware, and notes in the *Fourth NPRM*, there has been a dramatic increase instances of public safety agencies receiving interference from adjacent channel or adjacent band CMRS operations, especially in the 800 MHz band. However, APCO does not agree with the Commission's characterization in the *Fourth NPRM* that those problems result from poor receiver specifications in public safety radios. The public safety systems currently being impacted by adjacent commercial service systems were in place long before the interfering sources. At the time the public safety systems were installed, adjacent bands were occupied (if at all) by similar types of radio operations that also used noise limited design criteria. However, over the years, the basic engineering design of systems in adjacent bands has changed to account for the demographic and loading requirements of their owner/operators. It is this change in the mode of operations from a noise limited design criteria to an interference based design criteria (*e.g.*, cellular architecture) that has been the principal source of new interference to public safety systems.

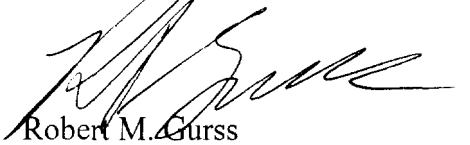
Pre-coordination database: As a frequency coordinator, APCO strongly supports the creation of the so-call "pre-coordination" database under the auspices of the National Public Safety Telecommunications Council (NPSTC). APCO also joins with NCC in urging that the Commission require all RPCs to utilize that database. One of the biggest problems that have occurred with the NPSPAC process has been the difficulty in coordinating a pre-allocated channelization for any given region with respect to adjoining regions. The best method to avoid these difficulties between regions is to provide, and mandate the use of, a single point pre-coordination database. The lack of information exchange between NPSPAC regions has resulted in a situation that is diametrically opposite of the original intent to ensure the availability of spectrum on an equitable basis to all public safety agencies. The result is delays that in some cases is counted in years. This means spectrum that lies fallow while agencies that have dire needs are left without recourse.

CONCLUSION

For the reasons discussed above, the Commission should proceed expeditiously to adopt final rules for the 700 MHz band.

Respectfully submitted,

ASSOCIATION OF PUBLIC-SAFETY COMMUNICATIONS OFFICIALS-INTERNATIONAL, INC.

By: 

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